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Original Article

An online survey of equestrian headcollar use and safety

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Summary

Background: Headcollars (halters, US) are one of the most commonly used pieces of equestrian 'tack'. Despite this, there appears to be minimal information on their use, or more importantly, risk factors for injury of horses/handlers.
Objective: To explore headcollar use and safety in equestrians.
Study design: Quantitative cross-sectional survey.
Methods: An online survey (19 questions) exploring headcollar use and safety was disseminated through equestrian social media. Frequency analysis and multivariable modelling identified how headcollar type was linked to use and injury risk.
Results: Most respondents (88%; n = 4786) used headcollars multiple times daily but for short time periods (66%, n = 3388, <30 min). A horse being injured as a result of wearing a headcollar was reported by 1615 (31%) respondents with 15% of incidents also injuring a person. Fractures (horses) occurred in 134 incidents, and 167 equine fatalities were reported. Across all headcollar types, the odds of injury risk increased by 1.7 times (confidence intervals (CI): 1.07–2.41, P<0.02) using a headcollar when mucking out. During travelling, headcollar use reduced the odds of risk of injury by 0.7 times (CI: 0.43–0.98, P<0.04). The odds of injury risk reduced when using leather (Odds ratio (OR): 0.8, CI: 0.66–0.96, P<0.01) or synthetic (OR: 0.8, CI: 0.58–0.85, P<0.0001) safety headcollars compared with standard headcollars of the same material. Thematic analysis identified three key themes: (1) need for increased education: fit, safety features and basic horse handling, (2) '*safer*' leather headcollars, and (3) increased safety focus required.
Main limitations: Data were self-reported and may be subject to memory recall errors; online surveys are subject to self-selection bias.
Conclusions: Increased user knowledge of risk factors for headcollar injury, combined with standardised guidance on how to correctly fit and use headcollars, would be beneficial to reduce injury risk.

Clinical relevance

- This preliminary study has identified an incidence rate for headcollar injury of 31 incidents per 100 people surveyed. Injuries ranged from cuts and bruises to fractures and fatalities.
- One- third of respondents reported that their horse was injured as a result of wearing a headcollar; 70% of injuries occurred when the horse was tied up and 20% occurred in the field.
- Increased education of horse owners on how to correctly fit and use headcollars may reduce injuries in horses.

Introduction

Headcollars (halters, US) are one of the most used pieces of equestrian 'tack'. Despite this, there appears to be little information on their correct use or injury-related risk factors. Headcollar-related injuries can essentially be divided into two categories: pressure-induced lesions of superficial anatomical structures or traumatic injuries to deeper structures as a result of application of high forces, for example, failure of a headcollar to release. Injuries may occur when the headcollar becomes caught on something. Alternatively, injuries may occur when horses are tied-up (including travelling) or being led. The prevalence of such injuries is unknown as they are rarely reported and are often suspected rather than observed.

Force-related tissue damage can occur over prominent bony areas with little overlying tissue; as such the head is vulnerable. Paresis of the buccal branch of the facial nerve occasionally occurs under general anaesthesia if the headcollar cheek piece of the dependent side is not sufficiently padded. Facial nerve paralysis in a horse has also been reported followed rope recovery from general anaesthesia (del Barrio *et al*. 2018). More severe injuries have been reported following traumatic headcollar accidents including fracture of the atlas (Volcholrt 1972), fracture of the paracondylar process of the occiput (Lischer *et al*. 2005) and atlantoaxial subluxation (Nixon and Stashak 1988). These accidents often involve strangulation-type events when the headcollar becomes caught on an external fixture such as a hook in a stable (Lischer *et al*. 2005). Occasionally, these injuries are so severe that the horse is found dead (K Pickles, personal observations).

Horse riding and handling are acknowledged to be dangerous activities for humans (Grossman *et al*. 1978; Chitnavis *et al*. 1996; Abu-Zidan and Rao 2003; Ball *et al*. 2009). Knowledge of specific risk factors is essential to implement strategies for injury prevention (Ingemarson *et al*. 1989; Hobbs *et al*. 1994). Although equestrian falls were the most common reason for emergency department admission in equestrians over a 5-year period, 37% (53/142) of these admissions were associated with injuries acquired during horse handling (Hobbs *et al*. 1994). Additionally, a recent review of injuries in 342 equestrians reported 21.3% of injuries to be associated with scenarios involving headcollar use (Carmargo *et al*. 2018). Unmounted injuries were also reported to be more severe than mounted injuries. A review of horse-related injuries in children found that 9/114 patients were injured by being dragged, potentially involving headcollar use (Wolyncewicz *et al*. 2018).

The aim of this study was to investigate equine headcollar use and safety using an online survey.

Materials and methods

Participants

Participants were recruited online via sharing a link to the survey on selected UK equine-related or discipline-specific social media (Facebook®) groups including, but not limited to, British Dressage, Endurance UK, Eventing UK and Horsepoo (regional). The survey invitation was targeted to include amateur and professional riders competing in either affiliated or unaffiliated competitions in the UK or working professionally in the equine industry, for example, veterinarians, physiotherapists, nurses, grooms, etc. Inclusion criteria required participants to be over 18 years of age. The survey was anonymous, and no personal data were collected although respondents could optionally provide an email address for entry into a prize draw. To reduce bias, the survey was promoted and disseminated by an independent third-party media company (Fox Red Media)[1].

Survey design

The study was designed as an online questionnaire (Survey Monkey®) with 17 closed questions, one ranking scale question and one open free-text question (**Supplementary Item 1**). The questionnaire was split into four major sections: participant demographics; headcollar usage; injuries related to headcollar use; and factors associated with headcollar choice. The survey employed routing features in relation to whether or not respondents had experienced horses being injured due to headcollars. The draft survey was tested by 10 experienced equestrian researchers and edited to correct any errors before being fully deployed. The survey was live for 35 days, and 65% of the responses were obtained within the first 14 days. Respondents were asked:

Demographic factors: equestrian activities (e.g. breeding, racing, dressage, transporter, vet, physio, etc), competition level and whether professionally involved in the horse industry (defined as either working full time or the majority of their income coming from the industry).

Headcollar use: how often and how long they used headcollars, reasons for using a headcollar, types of headcollars used and whether a safety device or baler twine was used.

Headcollar injuries: experience of a horse being injured as a result of wearing a headcollar, and if yes, the circumstances of the injury (e.g. location, frequency, how caused and severity), the type of headcollar involved and whether it functioned as expected. Respondents were also asked if they were injured in the incident.

Headcollar choice factors: for example, material, fit, durability, safety features, etc.

Data analysis

Descriptive analysis

Data were exported from Survey Monkey™ to Microsoft Excel™ Version 2010[2]. Frequency analysis identified the nature of respondents' equestrian activities, competition level and types of headcollar used. Additionally, frequency of headcollar use and experience of a horse being injured related to headcollar use, including details of how the injury occurred, injury type and severity were collated. Respondents ranked characteristics considered important (from 1: most influential to 8: least influential) when choosing a headcollar and an arithmetic median and interquartile range calculated for each factor.

Data met nonparametric assumptions; therefore, Kruskal–Wallis followed by Mann–Whitney U post hoc tests were performed to analyse characteristics influencing choice of leather, synthetic and webbing headcollars. Median rankings for individual factors were examined to identify the direction of differences between disciplines; where median values were the same, mean rank differences obtained from post hoc tests differentiated between disciplines. A Mann–Whitney U test was used to compare frequency of injuries in professional and nonprofessional equestrians. Significance was set at $P<0.05$.

Univariable analysis

Univariable analysis using the dependant variable 'headcollar injury: yes vs. no' was performed to establish potential risk across Model A: all headcollar types, Model B: leather headcollars, Model C: synthetic headcollars, and Model D: webbing headcollars. A variable with an alpha value of <0.10 was considered eligible for use in building the multivariable models (Bailey *et al*. 1997). Variables considered to be plausible risk factors that could influence headcollar injury risk were also eligible for inclusion (Parkin *et al*. 2006).

Multivariable analysis

A predictive multivariable logistic regression model was produced, using Statistical Package for the Social Sciences (SPSS)[3] 24, using the dichotomous variable: headcollar injury, yes vs. no across four multivariable models (All headcollar types: Model A; Leather: Model B; Synthetic: Model C; and Webbing: Model D). Each model was automatically fitted using a backward elimination stepwise process that excluded variables with a likelihood ratio test significance of $P<0.05$ (Parkin *et al*. 2006). For each step in the multivariable model building process, the effect of removal of variables was assessed using a likelihood ratio chi-squared test of model coefficients ($P<0.05$) to check that the new model was an improvement over the baseline model. This was done to ensure that variables that had a significant impact on the model were not excluded from further analysis. A Hosmer–Lemeshow goodness of fit test ($P>0.05$) was used to evaluate the fit of the model produced. The predictive ability of the final model was investigated using receiver operating characteristic (ROC) curve analysis. The risk of a headcollar injury was compared using the odds ratio (OR) and associated 95% confidence intervals (CI).

Thematic analysis

An inductive thematic approach, aligned with a grounded theory methodological framework, was used to analyse responses to the final open question. Inductive content analysis of responses was undertaken utilising tags ('open-coding') to create emergent themes ('focused coding'), using an approach adapted from Lamperd et al. (2016) and Braun and Clarke (2006), to ascertain themes related to headcollar design, use or safety.

Results

Respondent profile

A total of 5,615 respondents completed the questionnaire. The majority of these competed in dressage, showjumping and eventing, or were pleasure or leisure riders (**Table 1**).

Of competitive respondents, 32% (1799/5548) competed at local unaffiliated level, 13% (702/5548) at local affiliated and a further 21% at regional (11%, 599/5548) and national (10%, 542/5548) affiliated level. Only, 3% (145/5548) of respondents competed internationally. The majority of respondents (72%, 3975/5511) were not professionally involved with horses or the equestrian industry. Professional respondents included 435 trainers/coaches/instructors, 223 physiotherapists, 111 veterinary surgeons, 119 veterinary nurses/technicians and 26 horse transporters.

Headcollar use

The majority of respondents (88%; 4786/5444) used a headcollar multiple times daily (**Fig 1**) for short periods of time (<30 min) (**Fig 2**) which was compatible with the most commonly cited reasons use: grooming (74%, 3975/5351), tacking up (65%, 3499/5351), leading to and from turnout (95%, 5085/5351), mucking out (14%, 769/5351) and for travelling horses (83%, 4459/5351).

Respondents typically owned more than one headcollar (53%; 2992/5645); median ± IQR: 2 ± 1). Traditional (nonsafety) design headcollars were predominately used (80%, 4248/5310), with respondents often owning headcollars of different materials; leather was most popular (57%, 3002/5310) followed by synthetic (41%, 2169/5130) and webbing materials (33%, 1725/5310). Rope headcollars were used by 24% (1289/5310) of respondents; 3% (165/5310) used other types of headcollar with the Dually™ training headcollar[4] being the most popular. Only 20% (1093/5310) of respondents used safety headcollars: 5% (289/5310) leather, 12% (618/5310) synthetic and 8% (429/5310) webbing. Baling twine was always used between the lead rope and headcollar ring by 41% (2074/5250) of respondents, whilst 42% (2103/5250) never used baling twine, 8% (385/5250) occasionally and 9% usually (456/5250) using twine. A commercial safety tie was used by 2466 respondents; of these, 34% (832/2466) Equi-ping[5], 15% (372/2466) Safe-T tie[6], 11% (263/2466) Idolo tether tie[7] and 41% (999/2466) Quick clip[8].

TABLE 1: Range of equestrian disciplines or equestrian industries in which >2% respondents participated; respondents could indicate multiple disciplines/industries

Discipline/role	Number of respondents	Percentage of sample (n = 5615)
Veterinary surgeon	111	2%
Veterinary nurse/technician	119	2%
Racing (Thoroughbred)	166	3%
Rehabilitation yard	211	4%
Physiotherapist	223	4%
Starting/training yard	306	5%
Driving	322	6%
Endurance	373	7%
Trainer/coach/instructor	435	8%
Breeding	487	9%
Hunting	556	10%
Showing	902	16%
Eventing	1223	22%
Showjumping	1548	28%
Recreational/leisure riding (did not compete)	2192	39%
Dressage	2355	42%

Factors which influenced headcollar choice

Approximately half of respondents rarely purchased a new headcollar (49%, n = 2438), 30% bought one every 1–2 years (n = 1511), 15% (n = 762) every 6–12 months and 6% (n = 298) less than every 6 months. Headcollar fit, durability, material and safety features ranked as the most important characteristics when choosing a new headcollar, regardless of headcollar type (**Table 2**).

Headcollar injuries

A horse being injured whilst wearing a headcollar was reported by 31% (1615/5232) of respondents (**Fig 3**). Those professionally involved in the equine industry were significantly more likely to report an injury than nonprofessionals ($P<0.0005$). Increased injuries were reported by horse transporters 62% (16/26), trainers/coaches/instructors 44% (193/435), veterinarians 40% (44/111) and physiotherapists 52% (115/223) compared with veterinary nurses/technicians (2%; 2/119). Multiple factors were often related to the injury occurrence. The majority of injuries (71%, 1148/1615) occurred whilst horses were tied up: 58% (912/1576) outside, 34% (539/1576) in the stable, 32% (511/1576) tied to a trailer or lorry and 25% (397/1576) when travelling. Furthermore, 23% (745/1615) of injuries occurred in horses wearing headcollars in the field (not tied up) and 6% (214/1615) when horses were being led. Where injuries did occur, 39% (1027/2614) were due to the headcollar getting caught, 39% (1027/2614) were related to the horse pulling backwards, 11% (283/2614) were associated with the horse's foot getting trapped in the headcollar and 11% (295/2614) were related to various 'other' reasons. The top three 'other' reasons for injury were horses rubbing with the headcollar on (n = 60), the headcollar being left on too long (n = 47) and incorrect headcollar fit resulting in wounds (n = 39). Cuts were the most common type of injury reported (37%, 1336/3576), followed by bruising (31%, 1096/3576) and abrasions (24%, 843/3576), with fewer fractures (4%, 134/3576) and fatalities (5%, 167/3576) (**Fig 4**). Human injuries occurred in 207 of the headcollar incidents.

Injuries occurred across all types and designs of headcollar (**Fig 5**), but were most frequent in traditional design, synthetic headcollars (2.7, 1.8 and 4 times more frequent than leather, webbing and rope headcollars, respectively). The frequency of injuries was reduced in safety headcollars (leather: 1%, 14/1412; synthetic: 2%, 35/1412;

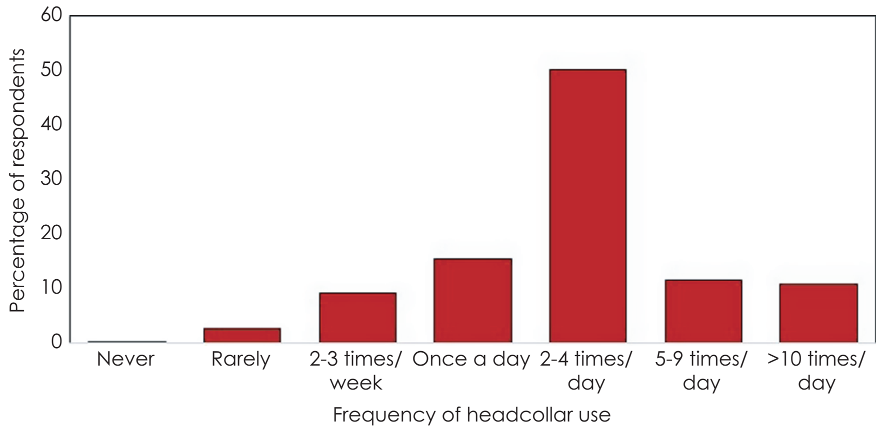

Fig 1: ***Frequency of headcollar use across respondents (n = 5444).***

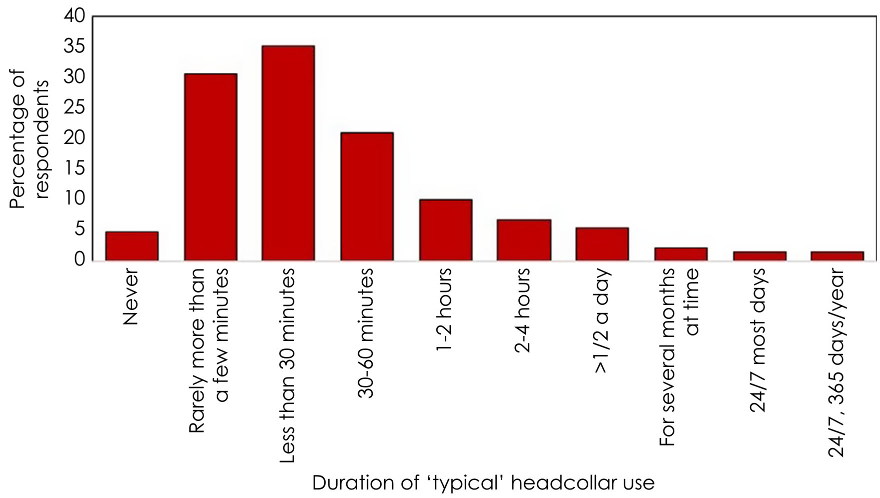

Fig 2: ***Typical duration of headcollar use across respondents (n = 5444).***

TABLE 2: Respondent rating (median ± IQR) of factors that influence headcollar purchase, where 1 was most important and 8 least important

Headcollar type	Appearance	Brand	Colour	Durability	Fit	Material	Price	Safety features
All	5 ± 3	8 ± 2	6 ± 3	4 ± 3	2 ± 2	4 ± 3	5 ± 3	4 ± 4
Leather	5 ± 3	8 ± 2	6 ± 3	4 ± 3	2 ± 2	3 ± 3	5 ± 3	4 ± 4
Synthetic	5 ± 3	8 ± 2	6 ± 3	4 ± 3	1 ± 2	4 ± 3	4 ± 3	4 ± 4
Webbing	5 ± 3	8 ± 2	6 ± 3	4 ± 2	1 ± 2	4 ± 3	5 ± 3	4 ± 4

webbing: 2%, 24/1412) than in headcollars used alone (leather: 12%, 163/1412; synthetic: 32%, 451/1412; webbing: 18%, 257/2093; rope: 8%, 116/1412) or with baling twine (leather: 6%, 79/1412); synthetic: 13%, 179/1412; webbing: 7%, 95/1412). Respondents reported that generally, headcollars involved in injury incidents had behaved as expected e.g. a traditional leather headcollar had broken under pressure and a safety headcollar had opened (leather: 73% (462/637), synthetic: 77% (813/1062), webbing: 73% (450/618) and rope: 80% (150/188)).

Thematic analysis identified three higher-order themes that respondents felt were related to headcollar design, use and safety: increased human education, use of leather headcollars and a core focus on safety (**Fig 6**).

Univariable analysis

Univariable analysis identified 16 variables, which were taken forwards to multivariable model building (Model A): competitive level, compete or not, frequency of headcollar use, use of headcollar: grooming, tacking up, leading, mucking out, travelling, leather headcollar, synthetic headcollar, webbing headcollar, rope headcollar, multiple headcollars, safety headcollar used and baling twine used. For Models B to D, variables related to headcollar type:

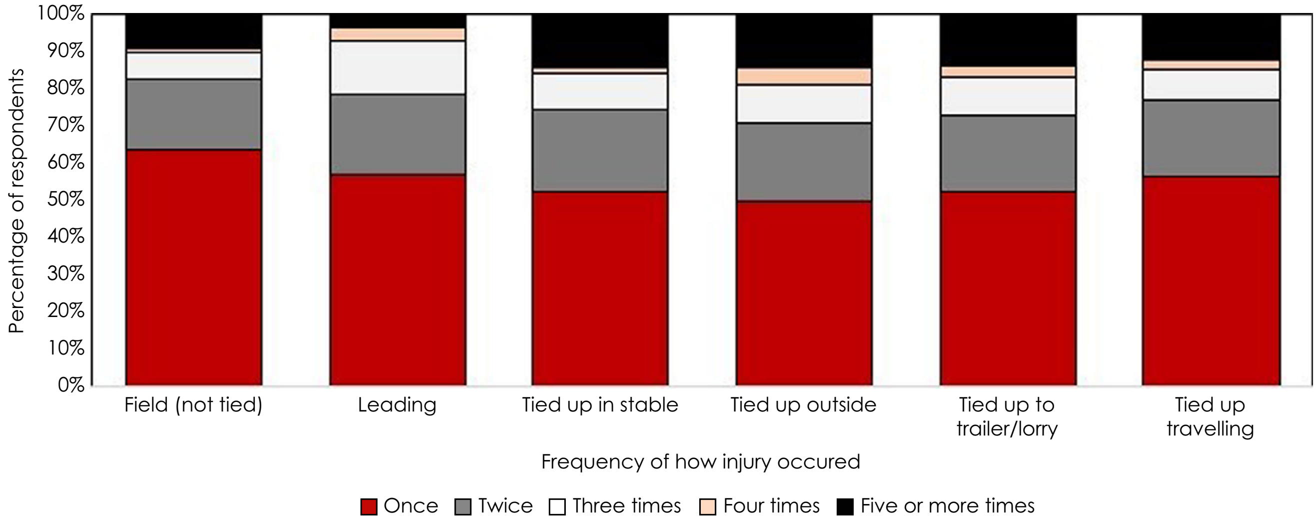

***Fig 3:** Frequency headcollar-related injuries occurred, within respondents who had experienced a headcollar-related injury (n = 1615).*

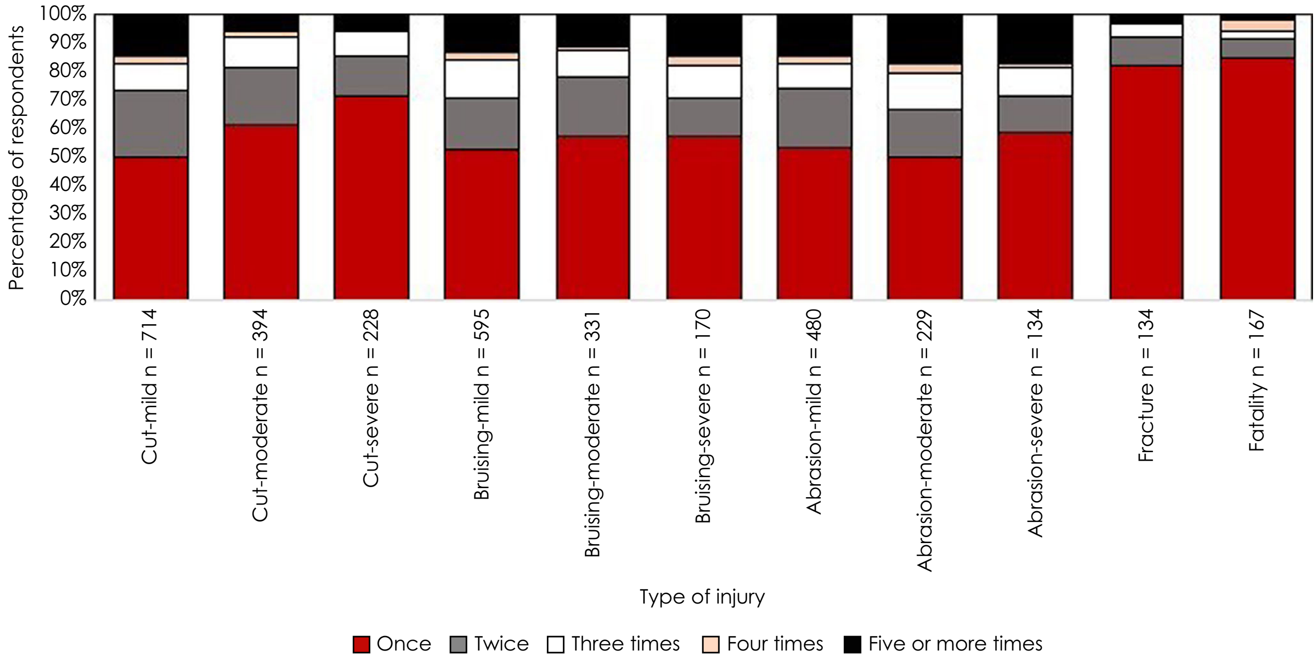

***Fig 4:** Frequency (once, twice, three times, four times or more than five times) of reported headcollar-related injuries as a percentage of total injuries of that type.*

leather, synthetic, webbing and rope were excluded prior to model building.

Multivariable analysis

Model A: Injury across headcollar types

Horses belonging to noncompetitive respondents were less likely (OR 0.3, CI: 0.22–0.42; P = 0.0001) to have a headcollar-related injury than those used competitively. Injuries were more likely (OR 1.7, CI: 1.07–2.41; P = 0.021) to occur when mucking out and less likely (OR 0.7 CI: 0.43–0.98; P = 0.04) when travelling (**Supplementary Item 2**: Table S1). There were reduced odds of injury risk when only one headcollar was used compared to using multiple headcollars (OR 0.71, CI: 0.50–0.99, P = 0.05). Whilst headcollar material was significantly associated with injury (P = 0.0001), no specific material type increased the odds of injury risk alone, but this variable was retained as it improved model fit. Hosmer–Lemeshow goodness of fit statistics confirmed that the model showed a good fit (P = 0.51). The likelihood ratio chi-squared test of model coefficients reported a significance level of P≤0.05 at each step. No significant interaction between variables was found. ROC curve analysis indicated that the predictability of the final model to prevent injury was excellent (ROC: 0.97).

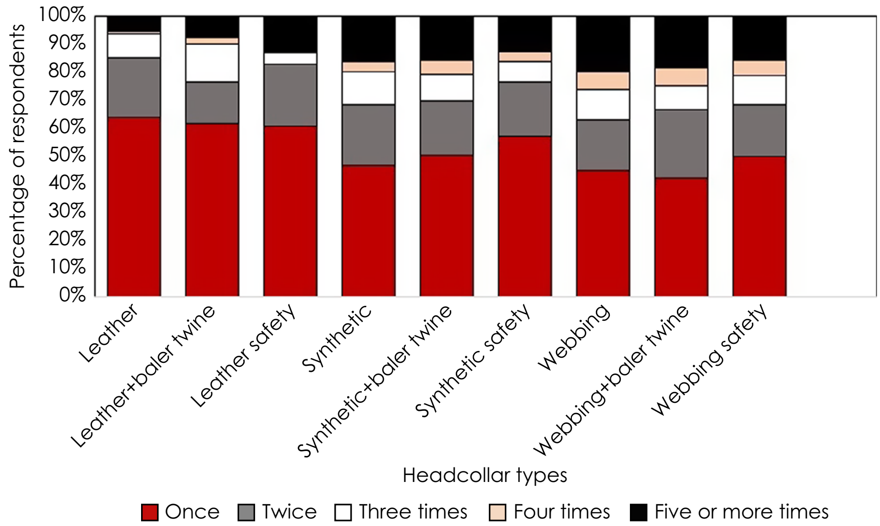

***Fig 5:** Frequency of injury within specific headcollar types used by respondents who had experienced a headcollar-related injury (n = 1615).*

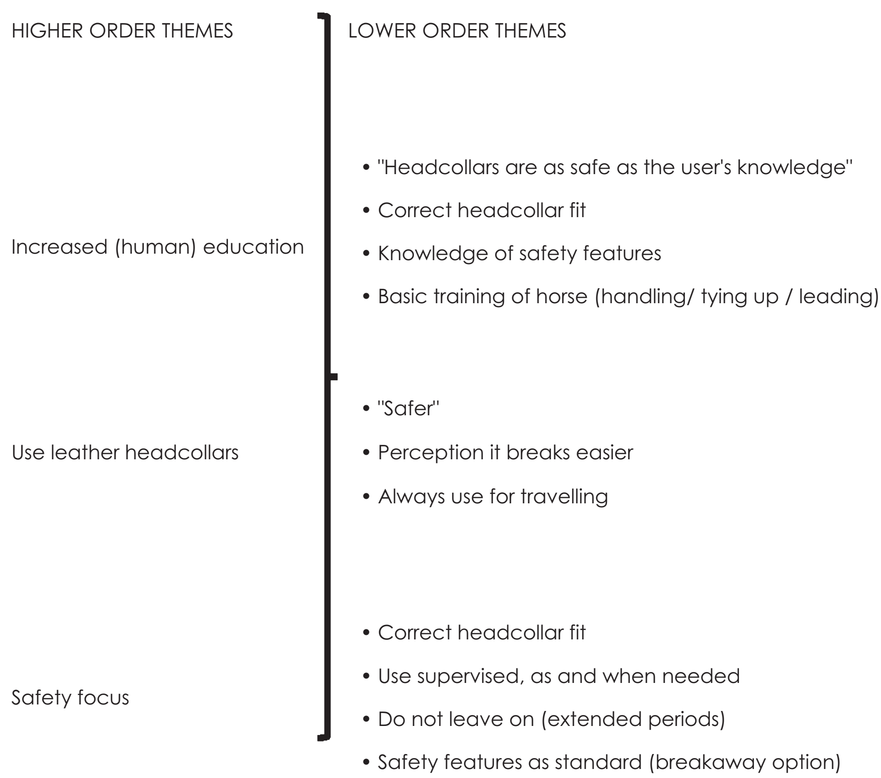

***Fig 6:** Researcher derived themes from respondent responses related to headcollar design, use and safety.*

Model B: Injury in leather headcollars

Horses wearing leather headcollars competing in affiliated, regional competitions were less likely (OR 0.66, CI: 0.50–0.86, P = 0.003) to get injured than noncompetitive horses, but no differences were found between horses competing at unaffiliated or affiliated level (**Supplementary Item 2**: Table S2). However, competitive riders were less likely (OR 0.41, CI: 0.34–0.48; P = 0.0001) to have a horse injured than those that did not compete. The use of a leather safety headcollar reduced the odds of injury risk (OR 0.80, CI: 0.66–0.96; P = 0.014). Usual use of baling twine increased the odds of injury risk (OR 1.3, CI: 1.08–1.52, P = 0.006) compared to always using it, whilst using it sometimes or rarely reduced the odds of risk of injury (OR 0.69 CI: 0.49–0.53, P = 0.031; OR 0.71 0.53–0.95, P = 0.021, respectively). Hosmer–Lemeshow goodness of fit statistics confirmed that the model showed a good fit (P = 0.897). The likelihood ratio chi-squared test of model coefficients reported a significance level of P≤0.05 at each step. There was a statistically significant two-way interaction between safety headcollar use and competing (F = 4.4; P = 0.04) and travelling (F = 0.9; P = 0.002), respectively. ROC curve analysis indicated that the predictability of the final model was moderate (ROC: 0.64).

Model C: Injury in synthetic headcollars

Horses which competed were more likely (OR 4.4, CI: 2.80–6.77, P = 0.0001) to get injured compared to those that did not compete. Using a synthetic safety headcollar reduced the odds of injury risk (OR 0.70, CI: 0.58–0.85, P = 0.0001) (**Supplementary Item 2**: Table S3). Using baling twine usually and sometimes reduced the odds of injury risk (OR 0.66, CI: 0.44–0.99, P = 0.046; OR 0.71, CI: 0.51–0.98, P = 0.036, respectively) compared to always using it. Hosmer–Lemeshow goodness of fit statistics confirmed that the model showed a good fit (P = 0.905). The likelihood ratio chi-squared test of model coefficients reported a significance level of P≤0.05 at each step. No significant interaction between variables was found. ROC curve analysis indicated that the predictability of the final model was moderate (ROC: 0.64).

Model D: Injury in webbing headcollars

Horses which competed were less likely (OR 0.41, CI: 0.33–0.50, P = 0.0001) to get injured compared to those that did not compete. Horses were more likely to get injured when travelling (OR 1.4, CI: 1.08–1.90, P = 0.013) (**Supplementary Item 2**: Table S4). Usual use of baling twine increased the odds of injury risk (OR 1.3, CI: 1.04–1.62, P = 0.021); in contrast, using it sometimes or rarely reduced the odds of injury risk (OR 0.76, CI: 0.47–1.23, P = 0.019; OR 0.65, CI 0.51–0.98, P = 0.036, respectively). Hosmer–Lemeshow goodness of fit statistics confirmed that the model showed a good fit (P = 0.980). The likelihood ratio chi-squared test of model coefficients reported a significance level of P≤0.05 at each step. No significant interaction between variables was found. ROC curve analysis indicated that the predictability of the final model was moderate (ROC: 0.64).

Discussion

Limitations of the present study: although a wide range of factors related to headcollar use was considered, the current study has some limitations. Data were self-reported and no defined timeframe within which headcollar injuries had occurred was stated; therefore, it could be argued that respondents' memories of injury occurrence could be vague, lack specific details and be disorganised (Koss *et al*. 1996). Dual representation theory suggests that there are two memory systems active during traumatic events: verbally accessible memory (VAM: stimulus information and emotional reactions) and situationally accessible memory (SAM: emotional and physiological reactions) (Brewin and Holmes 2003). SAM related to events are considered able to be accessed after retrospective reflection through the recovery process (Brewin and Holmes 2003). Therefore, we are reasonably confident that the respondents' ability to recall memories of equine or human injury related to headcollars was reliable and valid. Emotions have been shown to enhance memory recall; therefore, respondents that had experienced a traumatic or severe injury incident may have been more likely to recall details accurately than those who had experienced minor incidents (Erk *et al*. 2003). Whilst our sample was large, it may not be representative of the wider equestrian population. It is also conceivable that we may have encouraged owners with experience of a headcollar-related incident using the title 'How safe are headcollars' to promote the post online. It should also be noted that options for timeframes related to headcollar use were not all mutually exclusive, and therefore, some respondents may have had to select a category which did not accurately reflect how they used a headcollar or may have omitted this question.

The frequency of almost a third of respondents reporting an equine headcollar injury is concerning, particularly as injuries whilst the horse was tied-up accounted for 70% of the injuries. A further 24% of injuries occurred whilst horses were wearing a headcollar in the field. These are common husbandry practices used by owners often daily, or multiple times per day. The fact that only 20% of respondents used a safety headcollar suggests that horse owners perceive the risk of headcollar-related injury to be low. Injuries sustained were primarily cuts, bruising and abrasions; however, 134 horses sustained a fracture and 167 fatalities were reported. Respondents involved in a professional capacity within the equestrian industry reported more injuries than recreational and competitive horse owners. However, surprisingly, only 8% (11/134), 16% (21/134) and 12% (16/134) of fractures, and 7% (12/167), 14% (23/167) and 6% (10/167) of fatalities were reported by veterinarians, equestrian trainers/coaches/instructors and physiotherapists, respectively. Whilst case reports detailing severe headcollar-related incidents have been reported (Volcholrt 1972; Nixon and Stashak 1988; Lischer *et al*. 2005), this is the first study to investigate the occurrence of headcollar-related injuries. Within this sample, 31 headcollar injury events were reported per 100 people surveyed which, at face value, appears high. However, it is important to note that no timeframe for when the injuries occurred was collected and that 81% of respondents used headcollars multiple times daily, therefore, the true risk of headcollar injury cannot be determined. Given the frequency and severity of headcollar-related injuries reported here, further work is warranted to fully understand human- and horse-related risk factors that contribute to headcollar injury.

Nearly, 4% of respondents had been injured because of a headcollar-related incident; horses were, therefore, almost 8 times more likely to be injured than the handler/owner in this sample. Only, a single question was devoted to human injury, and so, further interpretation of the circumstances or role of headcollars is not possible. Although falls are widely reported to be the main cause of serious injuries to equestrians (Meredith *et al*. 2018), Hobbs *et al*. (1994) reported that 37% of emergency department admissions over a 5-year period were related to horses being handled. Similarly, Wolyncewicz *et al*. (2018) reported that 9/114 paediatric patients were injured by being dragged by a horse.

Whilst many headcollars, devices and practices (e.g. use of baler twine) are promoted as being 'safer', to date, there is little, if any, evidence to suggest this is true. Interestingly, the use of commercial safety devices and irregular use of baling twine did not lessen the frequency of a horse being injured. Currently, there is no recognised safety standard for headcollars and there appears to be no published information on factors such as breaking force of conventional headcollars or opening force of safety headcollars or devices. It is also unclear to what specifications manufacturers are producing headcollars. Similarly, there appears to be no industry-approved guidelines for headcollar fit, use, life span or safety checks. The frequency of horse injuries was reduced using safety headcollars compared with standard headcollars, and therefore, it would appear that these are indeed safer. Although baler-twine loops were always used by 40% of respondents, injuries were more common than in safety headcollars. However, fewer injuries were reported using baler twine compared with standard leather, synthetic, webbing or rope headcollars alone.

Across the equestrian sector, there are few standardised industry guidelines for tack and equipment despite the importance of correct fit for both horse and rider welfare and performance (McLean and McGreevy 2010). The Society of Master Saddlers sets standards and oversees the training of saddle fitters who can advise on saddle and bridle fit (Society of Master Saddlers 2020) and the International Society of Equitation Science has published guidance on noseband tightness (ISES 2019). Where evidence-based standards do not exist, it prohibits responsible horse owners and riders from applying them. Our results suggest that horse owners and riders would welcome further guidance on the correct fit and effective use of headcollars. The development of evidence-based, standardised industry guidelines for the use of commonly used tack and equipment, including headcollars, would support horse owner and rider education, and could enhance human and equine welfare by reducing injury.

The incorrect use of equipment, such as headcollars, can result in injury and compromised equine welfare (Jones and McGreevy 2010). Similarly training flaws within horse–human interactions, such as unsupervised or inappropriate headcollar use, could also result in unintentional equine injuries. Using a headcollar when mucking out increased the injury risk across all headcollar types. This could be related to most respondents not having a professional involvement in the equine sector and not being aware of industry guidance from the British Horse Society to adequately restrain an unfamiliar horse during mucking out, which is standard practice across many equestrian centres. Alternatively, many of the incidents reported here are likely to have occurred when respondents were handling their own horse. Using a safety headcollar reduced injury prevalence, yet despite this and the expressed desire to learn more about safety features, only 20% of respondents currently used one.

Leather is the traditional material for headcollars and was the most commonly used headcollar in the present survey, followed by synthetic and webbing headcollars. Leather is also anecdotally perceived as being safer as it is imagined to break when required (Williams and Tabor 2017); however, there appears to be no published data of the breaking strength of leather headcollars. Generally, headcollars involved in injury incidents, regardless of material, did behave as designed. However, the impact of repeated wear and tear on the durability and function of headcollars is unknown. Headcollar fit, durability, material and safety features were ranked as the most important characteristics when purchasing a headcollar, regardless of headcollar type. How to fit and use headcollars correctly were also identified as areas where increased horse owner and rider education was required. Further studies evaluating optimal headcollar fit, alongside investigation of durability and functionality, are required to allow evidence-based decisions for their selection and use (Williams and Marlin 2020).

Conclusion

Headcollars are used multiple times, every day, by most horse owners with an apparently high occurrence of headcollar-related injuries to both horses and handlers and a relatively high number of reported equine fatalities. Based on this sample, safety headcollars appear to reduce the risk of headcollar-related injuries to horses or handlers. There is a need for further research relating to headcollar function and industry-approved guidelines for headcollar fit and use.

Authors' declarations of interest

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Ethical animal research

Not applicable to this study.

Authorship

All authors contributed to study and survey design. J. Williams was responsible for data analysis. All authors prepared and edited the manuscript.

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Supporting information

Additional Supporting Information may be found in the online version of this article at the publisher's website:

Supplementary Item 1 : Headcollar safety survey.

Supplementary Item 2 : Multivariable models.